COVIDIEN™

Operation and Service Manual

Kendall SCD™

700 Sequential Compression System

700 Système de compression séquentielle
- Manuel d'utilisation et d'entretien

700 Sequenzielles Kompressionssystem
- Bedienungs- und Servicehandbuch

Sistema di compressione sequenziale 700
- Manuale d'uso e di manutenzione

Sistema de compresión secuencial 700
- Manual de funcionamiento y mantenimiento

700 Sekventiellt kompressionssystem
- Användar- och servicehandbok

700 sequentieel compressiesysteem
- Bedienings- en onderhoudshandleiding

Sistema de Compressão Sequencial 700
- Manual de Funcionamento e Assistência

700 jaksoittainen kompressiojärjestelmä
- Käyttö- ja huolto-ohjekirja

700 Sekventielt kompressionssystem
- Bruger- og servicevejledning

Σύστημα διαδοχικής συμπίεσης 700
- Εγχειρίδιο λειτουργίας και σέρβις

Sekvenční kompresní systém 700
- Uživatelská a servisní příručka

700 Szekvenciális kompressziós rendszer
- Kezelési és szervizelési kézikönyv

700 Система терапевтическая для последовательной компрессии
- Руководство по эксплуатации и обслуживанию

System stopniowanego ucisku 700
- Podręcznik obsługi i serwisu

700 Sıralı Kompresyon Sistemi
- Çalıştırma ve Servis El Kitabı

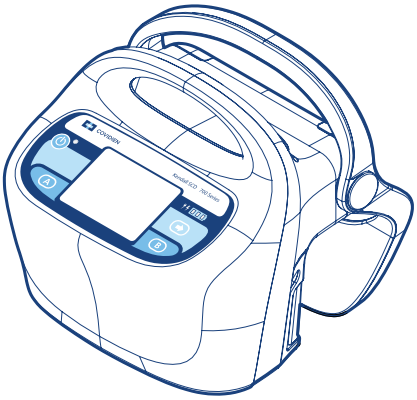
700 Sekvensielt kompresjonssystem
- Bruker- og servicehåndbok

Sekvenčný kompresný systém 700
- Príručka na obsluhu a servis

Sistem de compresie secvențială 700
- Manual de operare şi întreţinere

Система за последователна компресия 700
- Ръководство за работа и сервиз

700 压力系统
- 操作和维修手册



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Indications

The Kendall SCD 700 sequential compression system (hereby referenced as "Kendall SCD 700 series") is designed to apply intermittent pneumatic compression to increase venous blood flow in at-risk patients in order to help prevent deep vein thrombosis and pulmonary embolism. The System consists of the controller, the tubing sets (provided with the controller) and single-patient use garments (purchased separately from this controller). The garments, both leg sleeves and foot cuffs, compress the limbs to enhance venous blood movement. After the compression cycle has reached set pressure, the controller measures the time it takes for the limbs to refill with blood and waits that period of time before the next compression is initiated.

Leg Compression

The use of the Kendall SCD 700 series compression system with leg sleeves is indicated for:

1. Deep vein thrombosis and pulmonary embolism prophylaxis.

Foot Compression

The use of the Kendall SCD 700 series compression system with foot cuffs is indicated for:

1. Circulation enhancement.
2. Deep vein thrombosis prophylaxis.
3. Edema - Acute.
4. Edema - Chronic.
5. Extremity pain incident to trauma or surgery.
6. Leg Ulcers.
7. Venous stasis / venous insufficiency.

If you need further information regarding the Kendall SCD 700 series compression system or its clinical benefits, please contact your Covidien Sales Representative.

Contraindications

Leg Compression

The Kendall SCD 700 series compression system may not be recommended for use with leg sleeve on patients with the following:

1. Any local leg condition in which the sleeves may interfere, such as: (a) dermatitis, (b) vein ligation [immediate postoperative], (c) gangrene, or (d) recent skin graft.
2. Severe arteriosclerosis or other ischemic vascular disease.
3. Massive edema of the legs or pulmonary edema from congestive heart failure.
4. Extreme deformity of the leg.
5. Suspected pre-existing deep venous thrombosis.

Foot Compression

The Kendall SCD 700 series compression system may not be recommended for use with foot cuffs on patients with the following:

1. Conditions where an increase of fluid to the heart may be detrimental.
2. Congestive heart failure.
3. Pre-existing deep vein thrombosis, thrombophlebitis or pulmonary embolism.

Use with caution on the infected or insensitive extremity.

Cautions and Warnings

1. Federal (USA) law restricts this device to sale by or on the order of a physician.
2. Patients with diabetes or vascular disease require frequent skin assessment.
3. Explosion hazard. Not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
4. No modification of this equipment is allowed. It is acceptable to service and repair the components identified as serviceable in this document.
5. Although training on the use of the device is recommended, no special skills are required.
6. WARNING: Do not operate the controller if the power cord is damaged.
7. WARNING: Do not attempt to repair or replace broken tubing connectors as hazardous inflation of the sleeves may occur.
8. WARNING: To avoid the risk of electric shock, this equipment must only be connected to supply mains with protective earth.
9. WARNING: Do not position the controller so that it is difficult to disconnect the power cord from the AC outlet.

Explanation of Symbols

	Caution, consult accompanying documents.		Not made with natural rubber latex.
	Consult instructions for use.		Federal (USA) law restricts this device to sale by or on the order of a physician.
	Reorder number for the device located on the carton label.		Use By
	CE Mark		Device has not been subjected to a steilization process.
	Batch Code		

Controller Symbols

	Controller serial number		Manufacturing date code
	Keep away from sunlight.		Keep dry.
	Type BF protection against electronic shock.		Humidity limitations
	Manufacturer		Store between these temperatures.
	WEEE (Waste from electrical and electronic equipment)	**IPX3**	Protection against fluid ingress: spraying water
	Protective earth (ground)	**IP23**	Protection against fluid ingress: spraying water and particulates
	Equipotential ground point		

MEDICAL EQUIPMENT 47DA
UL60601-1, ANSI/AAMI ES60601-1:2005,
CAN/CSA C22.2 NO.601.1,
CAN/CSA C22.2 NO.60101-1 (2008).

Medical- general medical equipment as to electrical shock, fire and mechanical hazards only in accordance with UL60601-1, ANSI/AAMI ES60601-1:2005, CAN/CSA C22.2 NO.601.1, CAN/CSA C22.2 NO.60101-1 (2008).

Sterile Garment Symbols

STERILE EO — Sterile using ethylene oxide.

Single use device

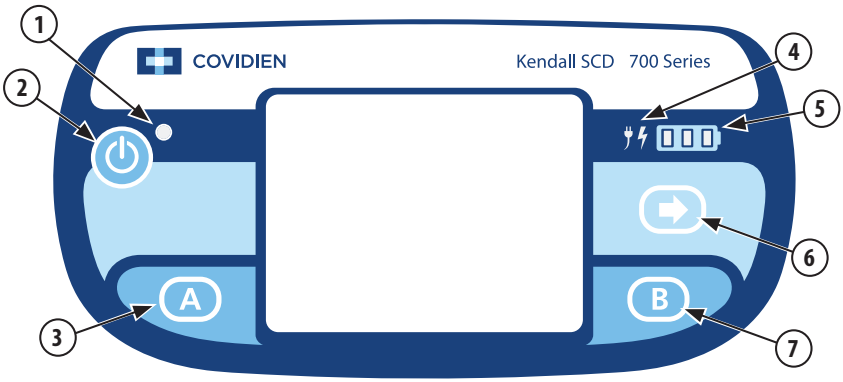
Do not use if package is opened or damaged.

Tubing Set Symbols

PHT DEHP — Device contains phthalates.

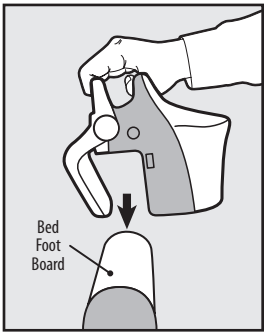
Constructed from recyclable materials.

Front Panel Display



Item	Explanation	Item	Explanation
1	Power On Indicator	5	Battery Status Indicators 1-3
2	Power On/Standby Button	6	Right Arrow Button
3	A - Button	7	B - Button
4	AC Power/Battery Charging Indicator		

Set up



- Place the controller on the footboard. This is done by grasping the device handle and the top portion of the pivoting bed hook and squeezing to open the gap. Place it on the foot board so it straddles the foot board and release the bed clamp. See the figure at right. Ensure its security. Alternatively, the device can be placed on a horizontal surface appropriate for the environment, such as on a table, within reasonable proximity to the point of use. Be sure to allow adequate air flow to the vents located at the power cord cover and below the tube set connection points.
- The controller can operate with one or two garments attached to the patient.
- Plug the tubing set(s) into the back of the controller. Route the tubing toward the patient's limbs, being careful to leave access ways clear and eliminate tripping hazards.
- Plug the tubes into garment(s) wrapped onto the patient's limbs.
- Match the left and right ports, marked B and A respectively, with the left and right limbs of the patient. Although the operation of the controller is not affected, troubleshooting can be easier. Check tubing set(s) for kinking and secure attachment at the controller and the garment(s).
- Plug the controller power cord into a properly grounded hospital grade receptacle. The blue AC Power Indicator will illuminate. If no AC Power is accessible, the controller can be run using its own internal battery power.
- If compliance monitoring is desired, refer to Section II.

Start-up

- Press the Power On/Standby button to begin normal operation. If using leg sleeves, no further user intervention is required unless there is a fault condition detected or if therapy must be discontinued.
- The controller will beep, flash all the LED's and illuminate the display screen. Quick internal device checks are performed, which may be audible to the user.
- The pump will begin to operate as part of the Garment Selection and Verification procedure.
- Detection of inoperative LED's, display screen and the audible error indication function at start-up is the user's responsibility.

Garment Selection and Verification

After startup, the Garment Configuration procedure allows the user to select when foot compression is required at either of the two controller ports:

- On the display, the Port A Leg and Port B Leg images blink to indicate the default garment configuration (leg compression).
- Pressing either the A or B Button will cause the corresponding port's leg image to shift to a foot image to signify foot compression. The buttons must be pressed for each port that is connected to a foot cuff to turn on the corresponding foot image(s).

Note: Leg sleeve compression is the default configuration when the controller is first powered on. Therefore, the A and B Button(s) do not have to be pressed to begin compression therapy when leg sleeves are being used.

The A and B buttons need to be pressed only when foot compression is to be used.

NOTE: If a garment is attached anytime after the Garment Detection procedure has started, the system must be restarted to ensure that the proper therapy will be applied to the limb(s).

Also after startup, the controller immediately begins conducting the Garment Selection and Verification procedure at each port to determine if the garments have been properly attached to the controller:

- If necessary, prior to the completion of Garment Selection and Verification, the A and B Button(s) may be pressed again to shift the garment image from the foot to the leg.
- During this phase, the compressor and valves are operating and air is delivered out the controller ports to detect the number and type(s) of garment(s) connected [Leg Sleeve(s) and/or Foot Cuff(s)].
- If the controller senses a properly attached garment and the type of garment detected matches the User-selected garment (or the default) configuration, then the corresponding image of a Leg Sleeve or Foot Cuff for both the A or B side will be displayed on the screen.
- If the controller senses a properly attached garment but the type of garment detected does not match the User-selected garment (or the default) configuration, then a Garment Mismatch error is triggered. Garment Mismatch errors can be corrected by pushing the corresponding A and B buttons to change the User-selected garment type (Leg or Foot). In the example below, the screen shows Foot Cuffs and indicates the user must press both A and B buttons (FIGURE 1).

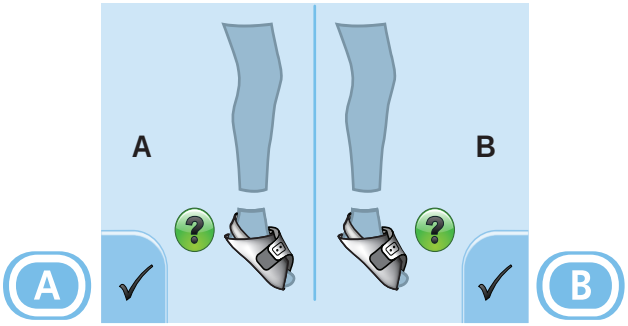


FIGURE 1

- Once the Garment Detection procedure is completed and any garment mismatch errors are addressed, the A and B button(s) will be disabled and normal operation begins by starting the compression therapy.
- If only one controller port is connected to a garment for single-limb compression, then the User-selected garment (or the default) configuration setting (Leg or Foot) for the open port will be ignored and both the leg and foot will be grayed out such as the example shown below (FIGURE 2).

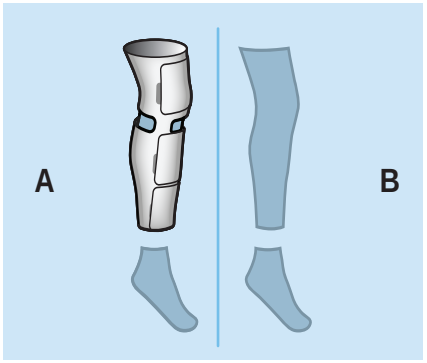


FIGURE 2

- If any garments are not properly detected or if no garments are attached to the controller, the system will trigger an E12 error. See section IV (Fault Conditions and Troubleshooting) in this manual. Check the garment application and tubing connections. In this case, either the system can be turned off and restarted or the corresponding A and B Button(s) can be pressed to confirm problem resolution and operation will continue without having to power the controller down and restarting.

Normal Operation and Pressure Adjustment

- Verify that the corresponding garment images match the disposable garment(s) applied to the patient.
- The controller automatically begins the process of applying intermittent compression alternating between limbs or to one if only one garment is applied.
- On successive cycles, the controller automatically adjusts its operating parameters to maintain set pressure.
- The pressure setting depends on the type of garment: 45 mmHg for Leg Sleeves; 130 mmHg for Foot Cuffs.

Vascular Refill Detection

- The Kendall SCD 700 series compression system incorporates Covidien's patented "Vascular Refill Detection" method to customize the therapy for each patient's physiology. This system measures the time it takes for the veins in the limb to refill after having been compressed by the system. The time is then used in subsequent cycles as the time between compressions.
- Vascular Refill Detection occurs automatically and requires no operator interaction.
- The Vascular Refill Detection method is used when first powering on the System after it reaches set pressure and every thirty minutes thereafter.
- During the entire time Vascular Refill Detection is in progress, a rotating ring symbol will display in the center of the screen as shown below in Figure 3. This symbol is informative only. No action is required by the user dring the Vascular Refill Detection Process.
- The method works best when the patient is still, however it will accommodate movement.
- If an error is detected during any measurement or if the compression is not within the System pressure specifications, the refill time measurement will be repeated after the next compression cycle.
- The time between compressions on the same limb will never be shorter than twenty seconds or longer than sixty seconds.
- If both controller ports are being used, then the longer of the two measurements will be used to adjust the time between cycles.

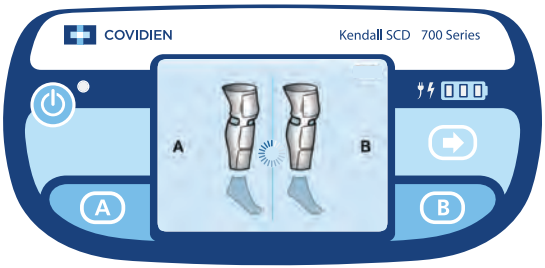


FIGURE 3

Shutdown

To terminate the operation, press the Power On/Standby button on the device.

Garment Compatibility

The Kendall SCD 700 series compression system is designed for use with Kendall SCD garment Reorder Codes:

Kendall SCD Sequential Compression Comfort Sleeves

74010	Thigh Length	X-Small
74011	Thigh Length	Small
74012	Thigh Length	Medium
74013	Thigh Length	Large
74021	Knee Length	Small
74022	Knee Length	Medium
74023	Knee Length	Large

Express Sleeves

9529	Knee Length	Medium
9530	Thigh Length	Medium
9545	Thigh Length	Small
9736	Thigh Length	Medium (sterile)
9780	Thigh Length	Large
9789	Knee Length	Large
9790	Knee Length	X-Large
73011	Thigh Length	Small
73012	Thigh Length	Medium
73013	Thigh Length	Large
73022	Knee Length	Medium
73023	Knee Length	Large

Kendall SCD Sequential Compression Comfort Tear-Away Sleeves

74041	Thigh Length	Small
74042	Thigh Length	Medium
74043	Thigh Length	Large

Express Tear-Away Sleeves

9530T	Thigh Length	Medium
9545T	Thigh Length	Small
9780T	Thigh Length	Large
73041	Thigh Length	Small
73043	Thigh Length	Large
73042	Thigh Length	Medium

Express Foot Cuff

5897	Regular
5898	Large
73032	Regular
73033	Large

Further instructions for garment application and use are included with the Leg Sleeve and Foot Cuff packaging.

Tubing Set Compatibility

The garments connect to the controller via the Tubing Sets provided with the controller. Additional or replacement Tubing Sets are available as Reorder Code 9528. The Extension Tubing Sets are also available as Reorder Code 9595.

Section II - Compliance Meter

Introduction

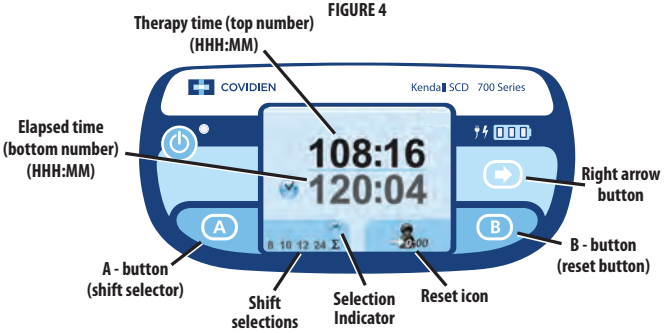
The Kendall SCD 700 series controller has a feature called the Compliance Meter, that can be used to monitor the amount of time a patient receives compression therapy either by shift, day or during an entire hospital stay. This unique feature operates in the background, so that it does not interrupt daily normal operation. Prior to using the compliance meter, confirm the controller has been set up as described in Section I.

Time is tracked using a numerator/denominator arrangement. The denominator (bottom number) is the elapsed time since the last Compliance Meter reset or can be chosen to show a moving window of time, such as a nurse shift. The numerator (top number) is the patient therapy time. It is the amount of time that compression therapy was applied to the patient during the elapsed period of time specified in the denominator. The time is expressed in hours and minutes.

Any time the controller is turned off or an error condition is present, thus halting normal operation, the therapy time (numerator) will not increment, but the elapsed time will increment. The maximum amount of time that can be displayed is 999 hours. After the controller is off for 40 days continuously, the Compliance Meter will reset to zero.

The Compliance Meter features are shown below:

FIGURE 4



Resetting the Compliance Meter

- The Compliance Meter can be accessed when the controller is on and is delivering therapy. The controller will sound a "deny" tone, three quick beeps, at any other time such as immediately after turning the system on and garment detection is in progress (garments blinking). Note: use of the Compliance Meter does not halt or otherwise affect the ongoing compression therapy.
- Reset the Compliance Meter to zero:
  - ◊ Access the Compliance Meter by pressing the Right Arrow button. Pressing it again will return the user to normal operating mode. If the Compliance Meter is accessed, but no further action is taken, then the system will change the display back to normal operation mode in thirty seconds.
  - ◊ Reset the Compliance Meter by pressing the B button. The confirmation screen will appear as shown in the figure below (Figure 5). Press the A button to select check mark to confirm the reset operation. To decline the reset, press the B button. After either A or B is pressed, the screen will revert to the Compliance Meter Screen.

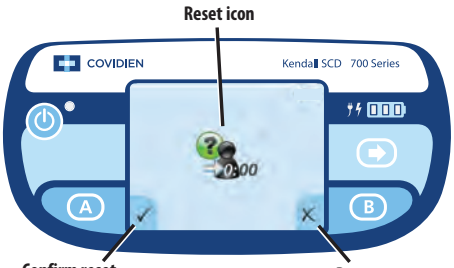


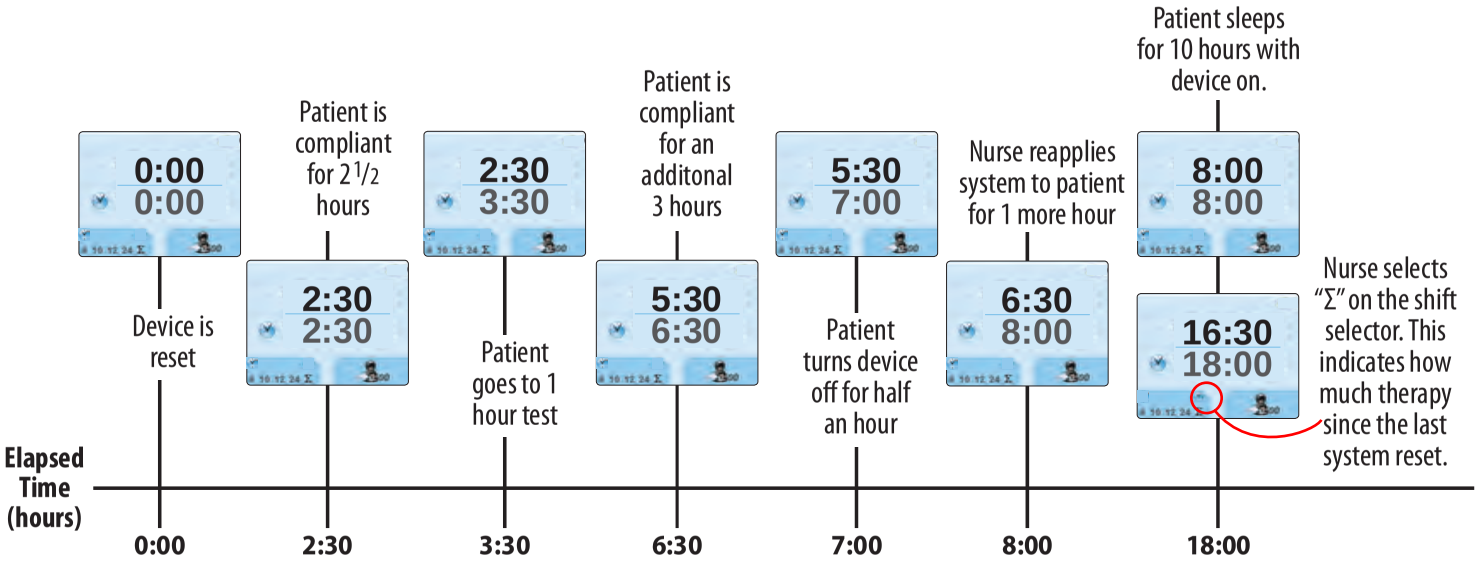
FIGURE 5

◊ If Compliance Meter reset is chosen, then the numerator and denominator will be reset to zero. The system will begin recording time starting from zero.
◊ If a reset is not initiated, then the Compliance Meter continues its operation. This may result in inaccurate compliance information for the patient. It is not recommended to reset the meter again until the device is assigned to a new patient.

Accessing the Compliance Meter

- At any time during the use of the device, compliance to the therapy can be checked. This will not interrupt therapy.
- Press the Right Arrow Button.
- A screen similar to Figure 4 will be displayed.
- The top number shown in the middle of the screen is the number of hours of Compliance that occurred during the period of time shown in the bottom number (elapsed time).
- Note that in the lower left hand corner of the screen, there are numbers and a symbol representing time durations of interest. 8, 10 and 12 are typical nurse shifts. 24 is a full day. The symbol Σ represents total compliance time since the last reset.
- Pressing the A button (shift selector) allows the user to select a time duration of interest. Note that the selection indicator moves with each button press.
- To determine the amount of therapy a patient has received over the most recent 8 hours, for example, select the '8' on the shift selector.
- To determine the amount of therapy a patient received over the most recent 24 hours, for example, select the '24' on the shift selector.
- Be aware, if the amount of elapsed time has not yet reached the time selected on the shift selector, then the actual elapsed time will display in the bottom number.
- Note that after 30 seconds of inactivity, the Compliance Meter will return to the normal therapy screen.

The example below shows a timeline of Compliance for a hypothetical patient. The 8 hour shift selection is active in this example:

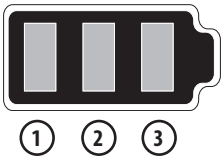


Section III - Battery Operation

The Kendall SCD 700 series compression system is designed to operate normally on AC line power or DC battery power without interruption. There are three Battery Status Indicator LED's used to represent the charge level of the battery. Once the controller is powered on, it may take the system a few seconds to establish communication with the battery and display the charge level. The battery Indicator shown below is located in the upper right hand corner of the user interface. See FIGURE 6.

Warning: If the ground integrity of the mains power cable is in question, the device should be operated on battery power until the ground integrity can be insured.

FIGURE 6



Battery Status Indicators

Unit plugged in and Powered On (Charging)

Battery State	Battery Status 1	Battery Status 2	Battery Status 3
100% charge	Green	Green	Green
67-99% charge	Green	Green	Green (Pulsing)
34-66% charge	Green	Green (Pulsing)	Off
0-33% charge	Green (Pulsing)	Off	Off

Unit not plugged in and Powered On (Operating on Battery)

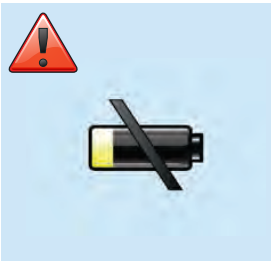
Battery State	Battery Status 1	Battery Status 2	Battery Status 3
67-100% charge	Green	Green	Green
34-66% charge	Green	Green	Off
< 34% charge	Green	Off	Off
15-40 minutes left*	Amber (Flashing)	Off	Off
< 15 minutes left*	Red (Flashing)	Off	Off

Unit Powered Off (charging when plugged in)

Battery State	Battery Status 1	Battery Status 2	Battery Status 3
0 -100% charge	Off	Off	Off

With 15-40 minutes of battery charge left, an audible error indicator will sound in a sequence of three beeps once every two minutes. Once there is less than 15 minutes of battery charge left, the audible error indicator will sound continuously and the dead battery icon will display as shown in FIGURE 7.

FIGURE 7



Charging the Battery

The battery will begin charging as soon as the unit is plugged into an AC power source. The amount of time required to charge the battery will vary depending on the battery's overall condition, age, and the controller's state during charging. For example, charging a new, fully drained battery will take approximately 4 hours with the controller on standby and 8 hours with the controller powered on. The Battery Status indicators should always be used to determine the state of charge for the battery. A fully charged battery will typically provide 6-8 hours of operation time depending on the sleeve configuration, sleeve application, and the battery condition.

Note: If the operation time on battery power is extremely short the battery should be returned for service or replacement.

Note: The battery performance may be reduced if it is left unused for extended periods of time. It is recommended that the battery pack be stored with a minimum charge of 50% and kept near 25°C (77°F) if prolonged storage is necessary.

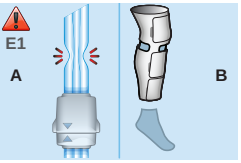
Battery Warnings

The Kendall SCD 700 series compression system battery pack contains Lithium Ion (Li-Ion) battery cells and must be used properly for safety and to maintain optimal performance.

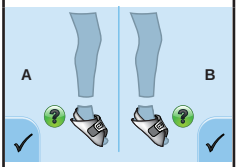
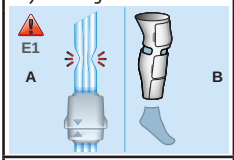
- Store spare battery packs between –20°C (-4°F) and 60°C (140°F).
- Do not drop, impact, or immerse in water.
- Do not touch or ingest any leaking electrolyte. If contact occurs, rinse skin and/or eyes immediately and seek medical attention if irritation develops. If ingested, contact local poison control center.
- Do not open battery, dispose of in fire, or short circuit. Doing so may cause the battery to ignite, explode, leak, or become hot and cause personal injury.
- Dispose of improperly working or damaged battery packs according to local regulations.
- Charge only with specified chargers according to Covidien's instructions.

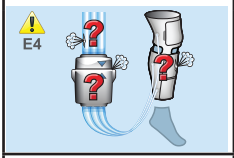
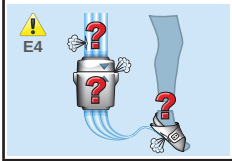
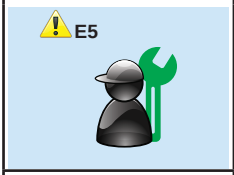
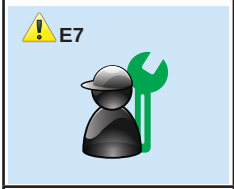
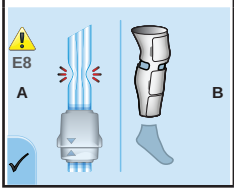
Section IV - Fault Conditions and Troubleshooting

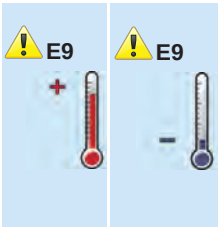
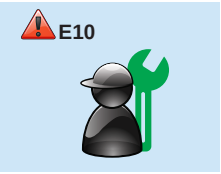
When the microprocessor detects a fault condition, it interrupts the normal operation of the controller, deactivates all valves to vent the air from the garment(s), displays a fault code, and sounds an audible error indicator. If a Garment Mismatch error is triggered the user may remedy the problem by pressing the corresponding A and B Button(s). Some errors will remain active until the controller is turned off, or the battery runs out of charge (if operating on battery power). Others can be reset once the user confirms the cause of the error and remedies the problem.

Error Types:	Description	Example
Service Required	Error code is present because of a failed internal component. It can not be addressed by the user.	
Manual Reset Required	Error that can be troubleshot and corrected by the user but requires the device to be powered off and on. If the error persists, then the controller requires service.	
User Resettable	This type of error allows the user to remedy the issue and resume operation by pressing the A and B button(s) corresponding with the port affected without powering the unit down. For this type of error, a check mark will be shown indicating what port is the area of concern. A yellow triangle indicates a low concern error. If the triangle is red it is indicative of an error related to a pressure that is high in an abnormal way. If the error persists, then the controller requires service.	

Error Codes

Error Code	Error Type	Description	Troubleshooting
Garment Mismatch Error 	User Resettable	The Garment Detection procedure has detected a garment configuration (Leg or Foot flashing green) that does not match the User-selected configuration (Leg or Foot red).	Press the port configuration button(s) to turn the foot selection on/off depending on what type of garment(s) is connected to the controller. If the proper garment is selected and the problem persists have the controller serviced by a professional.
System High Pressure Error 	Manual Reset required	System pressure has exceeded 90 mmHg (Leg sleeve) or 180 mmHg (Foot Cuff).	Check for kinked tubes or patient interference with the garments, like pressing foot against foot board.
High Pressure (Leg Sleeves)	User Resettable	Leg Sleeve pressure is greater than 47 mmHg for 10 consecutive cycles; or pressure is above 65 mmHg for 5 consecutive cycles.	Check for a tight leg sleeve and adjust fit appropriately. Also check for a partially occluded tube.
High Pressure (Foot Cuffs)	User Resettable	Foot Cuff pressure is greater than 135 mmHg for 10 consecutive cycles or pressure is above 160 mmHg for 5 consecutive cycles.	Check for a tight foot cuff and adjust fit appropriately. Also check for a partially occluded tube.
Low Pressure (Leg Sleeves)	User Resettable	Leg Sleeve pressure is less than 43 mmHg for 10 consecutive cycles.	Check for leaks in the sleeve or the tube connections.
Low Pressure (Foot Cuffs)	User Resettable	Foot Cuff pressure is less than 125 mmHg after 10 consecutive cycles.	Check for leaks in the cuff or the tube connections.

Error Code	Error Type	Description	Troubleshooting
Low Pressure (Leg Sleeves) 	User Resettable	Leg Sleeve pressure is not between 35 and 55 mmHg for 12 consecutive cycles.	Check for leaks in the sleeve or the tube connections.
Low Pressure (Foot Cuffs) 	User Resettable	Foot Cuff pressure is not between 110 and 150 mmHg for 12 consecutive cycles.	Check for leaks in the cuff or the tube connections.
Valve Feedback Error 	Service Required	If a valve electrically malfunctions, this error will be displayed.	Service Technician only: Verify that the valve assembly wires are properly connected and confirm solenoid actuation.
Software Error	Service Required	Upon startup, and periodically during operation the microprocessor performs diagnostic tests. If a software error is detected, this Error Indicator will be triggered.	Return to Covidien for service.
Compressor Error 	Service Required	If the compressor electrically malfunctions this error will be displayed.	Service Technician only: Verify that the compressor wires are properly connected.
Vent Error 	User Resettable	The pressure in a garment is greater than 20 mmHg at the end of any vent period.	Check tubing for kink or occlusion. Check garment application (too loose or tight). Service Technician only: Check for kinked internal tubing.

Error Code	Error Type	Description	Troubleshooting
Temperature Error 	Manual reset required	If the internal case temperature of the controller drops below 5°C (41°F) or exceeds 55°C (131°F).	High temperature: Make sure the controller is not covered by bedding and that the fan port, located near the power cord is not obstructed. Low Temperature: Allow the system to warm to room temperature.
Battery Error 	Service Required	Safe battery operation of the controller can not be ensured.	Service Technician Only: Ensure that an unauthorized battery pack replacement has not been made. Replace pack or return to Covidien for service.
Tubing Disconnect Error	User Resettable	Pressure measured in the inflatable garment is below 10 mmHg for 10 consecutive cycles or no garments are detected during startup.	Check for disconnected tube sets or garments and reconnect.
Pressure Transducer Error	Service Required	The system could not sense a pressure rise of more than 5 mmHg during an inflation cycle or during start up.	Service Technician Only: Check the transducer tube inside the controller and ensure it is neither kinked or disconnected.
Low Battery Error	Recharge Battery	There is less than 15 minutes of battery charge remaining. The pump and valves will continue to operate for as long as there is enough power.	Plug the controller into an AC power outlet.

Section V - Service and Maintenance

This service manual is intended for use as a guide to technically qualified personnel when evaluating System malfunctions. It is not to be construed as authorization to perform warranty repairs. Unauthorized service will void the warranty.

Introduction

The Kendall SCD 700 series controller contains no user serviceable parts. User maintenance is covered in the sections that follow. All other maintenance must be performed by technically qualified service personnel.

Service technicians should be familiar with the operator's portion of this manual and the operating principles of the Kendall SCD 700 series compression system. If a controller is to be returned to Covidien for service, a description of the operating conditions and the fault code displayed should accompany the unit. The fault codes displayed by the controller are useful in diagnosing service problems.

This manual describes service procedures to the circuit board level, with an exploded view of the controller shown in Figure 9. If a component failure on a circuit board is suspected, the unit should be returned for service. It is recommended that the system be returned with the circuit board in place, as removal of the board(s) involves additional risk of mechanical damage and damage from electrostatic discharge (ESD).

Warranty and Factory Service

Covidien warrants that your Kendall SCD 700 series compression system is free from defective material and workmanship. Our obligation under this warranty is limited to the repair of controllers returned to a service center, transportation charges prepaid, within one year of delivery to the original purchaser. Specifically, we agree to service and/or adjust any controller as required if returned for that purpose, and to replace and repair any part which, upon our examination, is proven to have been defective. This warranty does not apply to the Tubing Set or the disposable garments, or to equipment damaged through shipping, tampering, negligence, or misuse, including liquid immersion, autoclaving, ETO sterilization, or the use of unapproved cleaning solutions. To the extent permitted by applicable law, this limited warranty does not cover, and is intended to exclude, any and all liability on the part of the Company, whether under this limited warranty or any warranty implied by law, for any indirect or consequential damages for breach hereof or thereof. Except as expressly provided above in the limited warranty, to the extent permitted by applicable law, the Company hereby negates and disclaims all express and to the extent permitted by applicable law, implied warranties, including the warranties or merchantability and fitness for a particular purpose. controllers requiring repairs should be sent to a service center. Call one of the service centers listed. Obtain a return material authorization number and ship the controller, prepaid and insured in the original carton.

CANADA
Covidien Canada
7300 Trans Canada Highway
Pointe-Claire, Qc H9R 1C7
877-664-8926

UNITED STATES
Covidien
5920 Longbow Drive
Boulder CO 80301
1- (800) 962-9888

OUTSIDE U.S. AND CANADA
Covidien
Service Centre
Unit 2 Talisman Business Centre
London Road
Bicester, England OX26 6HR
(+44)1869328065

Disposal

If the controller, tubing assembly and/or garment(s) is to be disposed of, follow the local country regulations taking environmental factors into consideration.

Service Precautions

- Always unplug the controller from Mains voltage before servicing the controller.
- Use proper techniques such as grounding straps and pads to protect printed circuit board assemblies from ESD (Electrostatic Discharge).

Fan Filter, Exhaust Filter and Ventilation

CAUTION: Unplug the controller before accessing the fan filter or exhaust filter.

The fan filter and exhaust filter must be kept clean to ensure continued trouble-free operation. The controller should never be run without the fan filter and exhaust filter in place. Clean or replace the filter when required. See instructions in the General Disassembly/Reassembly Section.

During system use, obstruction of the fan cover and vents should be avoided. Free flow of air is necessary to prevent overheating and premature component failure.

Fuses

CAUTION: Unplug the controller before replacing the fuse(s).

Blown fuses should only be replaced by those indicated on the power supply board near the location of the fuses at the AC inlet. Use only 1.6 A, 250 VAC, 5x20mm Slo Blo fuses. The use of fuses that have the Semko and/or VDE marking is preferred. If a fuse blows a second time, it should be presumed that the controller is defective and requires further service. Please contact your service center. Fuses are not accessible from the outside of the controller. Refer to the Disassembly/Reassembly procedures later in the manual. The fuses are located on the power supply board as part of the power inlet module under the fuse cover.

Electrical Safety CAUTION: Be sure the controller is disconnected from the AC power source before any disassembly. A potential SHOCK HAZARD exists when the front cover is removed even with the unit turned off.

Note: The power supply cord/plug serves as the electrical supply mains disconnect device.

To facilitate electrical safety testing, the controller has an equipotential lug, located on the back of the device opposite the power cord. There are no other grounded exposed metal parts. Power cord resistance should not exceed 0.2 ohm. If ground resistance exceeds this value or the insulation integrity of the unit has been compromised through mechanical damage, the controller should be returned to a service center for testing and repair.

Suggested Preventative Maintenance Schedule

Proposed Maintenance	After Any Repair	Once Per Year
Inspect and Clean Fan Filter and Exhaust Filter	X	As Required
Verify Transducer Calibration (Test Modes T3 and T4)	X	X
Electrical Safety Tests	X	X
General Function Test (Test Mode T2)	X	

The expected service life of the Kendall SCD 700 series controller is 5 years. However, the life of the controller can be extended indefinitely by replacing components if they fail. Refer to the spare parts listing within this Operation and Service Manual.

Error History

The Kendall SCD 700 series compression system stores the ten most recent error codes for use in troubleshooting devices returned from use. There is a test access mode, discussed later in this manual that describes exactly how to use the feature.

Cleaning

CONTROLLER CLEANING

The controller enclosure can be cleaned with a soft cloth dampened with water or a mild detergent. To sanitize the device, apply cleaning agents with a cloth or wipe. Avoid excessive spraying, especially in the areas of the connection ports on the back of the device. If any liquid enters the ports, then internal component damage will likely result. The table at right provides optional cleaners and their chemical components.

The Kendall SCD 700 series compression system cannot be effectively sterilized by liquid immersion, autoclaving, or ETO sterilization, as irreparable damage to the System will occur.

700 SERIES CONTROLLER CLEANERS	
Chemical component (with approximate concentrations)	**Commercial Example**
0.5% bleach solution	Dispatch™*
70% Isopropanol alcohol	Generic
0.37% o-Phenylophenol	Precise™*
0.15% dimethyl benzyl Ammonium Chloride, 0.15% dimethyl ethylbenzyl Ammonium Chloride	Spray Nine™*
7.35% Hydrogen Peroxide, .023% Peracetic Acid	Sporgon™*
3.4% Glutaraldehyde	Cidex™*
Dodecylbenzene Sulfonate, Coconut Diethanolamide diluted per instructions	Manu-klenz™*

TUBE SET CLEANING

The tube sets can be cleaned with a soft cloth dampened with water or a mild detergent. Do not immerse. The table at right provides optional cleaners and their chemical components.

TUBE SET CLEANERS	
Chemical component (with approximate concentrations)	**Commercial Example**
0.5% bleach solution	Dispatch™*
70% Isopropanol alcohol	Generic
7.35% Hydrogen Peroxide, .023% Peracetic Acid	Sporgon™*
Dodecylbenzene Sulfonate, Coconut Diethanolamide diluted per instructions	Manu-klenz™*

Electrical/Electronics Description

Line voltage is fed into the controller through the power cord to the power supply mounted in the rear case of the controller. It is important to disconnect the power cord at the outlet before opening the controller case. Exposure to high voltage on the Power Supply PC Board is likely to occur if it is electrically live.

The power supply converts AC line voltage, 100 to 240 VAC, to DC voltage to power the controller components, including the main controller PC Board that is mounted onto the front case. Alternately, the main controller PC Board may be directly powered by the battery pack. The controller PC Board controls all functionality of the system and includes the transducer and buzzer. It does not contain any high voltage. The buttons and indicator LED's on the front display of the controller are integrated into the membrane panel which connects to the controller PC Board.

Covidien does not recommend any attempt to repair printed circuit boards. In manufacturing, extensive testing is performed that cannot be duplicated in the field without specialized equipment. Improper repair could result in patient or user hazards.

Pneumatic Operation Description

When the controller is turned on, the compressor operates and the valves are cycled to verify the garment type selected by the user. After garment selection and verification has completed, an inflation cycle is initiated, releasing air through the set of valves, mounted to a manifold. A transducer monitors the pressure in the garments. The reading from the transducer assists the controller in adjusting the pump's motor speed to deliver the proper pressure to the garments in the appropriate amount of time.

Section VI - Test Methods and Calibration

The Kendall SCD 700 series compression system has various test modes that can be accessed by the service technician. They are intended for use by qualified personnel. To activate the test modes follow these steps for entering "Test Access Mode". FIGURE 8 shows the user interface features used in Test Access Mode.

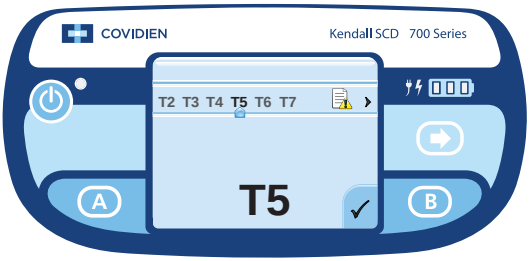


FIGURE 8

- Plug the controller into an outlet supplying the appropriate line voltage. Do not activate the test modes while operating on battery power.
- Press the B Button at the same time while turning the controller on. Hold the B button for a moment until test mode access can be confirmed visually.
- The buzzer will beep and T1 will be underscored and will illuminate signifying "Test Mode T1".
- The user can cycle through the test modes by pressing the Right Arrow button. Each test mode is indicated by the slider under the corresponding test mode and the selected test mode is shown at the bottom of the screen for clarity. Pressing the Right Arrow Button with the last test mode number illuminated error history will cycle the test mode back to Test Mode T1.
- After selecting the desired test mode, the B Button can be pressed to initiate the test.
- If test access is entered but no test mode is selected within 2 minutes, it is assumed that the test access mode was entered inadvertently and a Low Pressure error will be triggered.
- If a test mode is entered and left idle for 5 minutes the unit will revert back to test access mode selection.
- To exit Test Access Mode, turn the controller off.

Test Mode Look up Chart

T1 – Burn-In Feature
T2 – General Function Test
T3 – Pressure Transducer Calibration
T4 – Pressure Transducer Calibration Verification
T5 – Self Test
T6 – Performance Test
T7 – Manufacturing Test
Error History Mode

Test Mode T1 - Burn-In

Note: Burn-In mode is used in manufacturing to ensure proper assembly, to identify premature failures. This mode is not generally used outside of the manufacturing environment.

- Verify nothing is plugged into the ports on the back of the controller and enter test access mode. Select Test Access Mode 01.
- Press the B Button to begin Burn-In. The compressor will operate and the valves will actuate, releasing air out of the ports. The process repeats continuously until the Burn-In period is complete (approximately 16 hours).
- The battery will be discharged then charged to approximately 70% charge level.
- When 16 hours of Burn-In is completed the controller will go into error mode, blinking Test Access Mode T1. The buzzer will not pip during this error.

Test Mode T2 - General Function Test

- With nothing plugged into the ports on the back of the controller, enter test access mode. Select Test Access Mode T2.
- Press the B Button to begin the test.
- Pressing the A Button during this test will cause each one of the LED's to illuminate one at a time in succession and the audible error indicator to pip.
- Pressing and holding the B Button will increase the pump speed to its maximum in 4-5 seconds.
- Releasing the B Button will allow the pump to decrease its speed.
- The valves will actuate in succession (valve #1 through valve #6) for two seconds each.

Test Mode T3 - Pressure Transducer Calibration

Note: The transducer used in the Kendall SCD 700 series compression system is a state-of -the-art, highly precise and virtually drift free device.

Factory calibration certification is void if the case is opened. Recalibration is rarely required and should be done only when necessary.

Always perform test T4 before test T3 to verify the pressure transducer calibration.

Required Equipment: A regulated, precision air source accurate to ±0.2mmHg over a range of 0 to 130 mmHg.

- With nothing plugged into the ports on the back of the controller, enter test access mode. Select Test Access Mode 03.
- Press the B Button to begin the test.
- The T3 will blink on the display screen until the calibration procedure is completed or an error condition occurs.
- Valve #1 will be energized throughout the procedure, so that the user can verify the calibration of the pressure transducer with the controller case open or closed. The pressure standard can either be directly connected to the transducer with the case open, or it can be attached to the Bladder #1 location at Port A with the case closed. The Bladder #1 location is the left-most fitting within Port A (as viewed from the back of the controller).
- The controller will prompt the user to apply the pressure to the controller by displaying the required pressure on the screen. Once the applied pressure is confirmed and stable, the B Button is pressed to proceed to the next pressure. The controller requires a multipoint calibration at 0, 18, 45 and 130 mmHg.
- It is required that the pressure source be accurate to +/- 0.2 mmHg and that it is stable.
- The controller will start calibration by displaying "0 mmHg". Each time the B Button is pressed the display will advance to the next pressure in succession. After the last calibration step, press B again to reenter Test Access Mode.

- Upon completion, the new calibration values are recorded into memory and the unit beeps and reverts back to Test Access Mode.
- If the calibration test mode is exited before the process is completed, the previous calibration values remain unchanged.
- If a pressure outside of an expected range is sensed during any of the calibration steps an error indicator will be activated.

Test Mode T4 - Pressure Transducer Calibration Verification

Note: The transducer used in the Kendall SCD 700 series compression system is a state-of-the-art, highly precise and virtually drift free device.

Factory calibration certification is void if the case is opened. Recalibration is rarely required and should be done only when necessary.

Always perform test T4 before test T3 to verify the pressure transducer calibration.

Required Equipment: A regulated, precision air source accurate to ±0.2mmHg over a range of 0 to 130 mmHg.

- With nothing plugged into the ports on the back of the controller, enter test access mode. Select Test Access Mode T4.
- Press the B Button to begin the test.
- The T4 will blink on the display screen until the calibration verification procedure is completed or an error condition occurs.
- Valve #1 will be energized throughout the procedure, so that the user can verify the calibration of the pressure transducer with the controller case closed. The pressure standard can be directly connected to the Bladder #1 location at Port A with the case closed. The Bladder #1 location is the left most fitting within Port A (as viewed from the back of the controller).
- The controller will prompt the user to apply the pressure to the controller by displaying the required pressure on the screen. Once the applied pressure is confirmed and stable, the B Button is pressed to proceed to the next pressure. The controller requires a multipoint calibration at 0, 18, 45 and 130 mmHg.
- It is required that the pressure source be accurate to +/- 0.2 mmHg and that it is stable.
- The controller will start calibration verification by displaying "0 mmHg". Each time the B Button is pressed the display will advance to the next pressure in succession. After the last step, press B again to reenter Test Access Mode.
- For each of the calibration verification steps, the target pressure will be shown on the screen. If the system reads pressure applied to the controller outside the correct range, then the pressure value will be shown in red with either a less than symbol "<" or greater than ">" symbol to indicate the direction of the error. If the pressure read is within the calibration range, then the target value will be shown in green.
- Calibration Verification mode does not change calibration values.

Test Mode T5 - Self Test

- Enter Test Access Mode and select Test Access Mode 05.
- Press the B Button to begin the self test.
- The T5 will blink on the display screen until the test is completed.
- The audible error indicator will pip and the unit will perform the full array of tests performed during Start-up.

Test Mode T6 - Performance Test

When in this mode, the user can verify the pump and valve performance, pressure delivery, and the airflow through the pneumatic circuit. In manufacturing, this test is conducted with known volumes connected to the sleeve s. Then the inflation cycles run during the test at the low and high pump speeds create backpressures in the volumes that are measured and used to verify system performance.

- Attach a tubing set connected to leg sleeves wrapped around appropriately sized leg forms.
- Enter Test Access Mode and select Test Access Mode T6.
- Press the B Button to begin the Performance Test.

- The T6 will blink on the display screen until the test is completed.
- After initiating the performance test, the A Leg icon will flash in sync with an audible error indicator.
- After the B Button is pressed the A Leg icon will stop flashing, the error indication will stop, and the controller will then go through a normal inflation cycle on port A with the pump operating at a low speed throughout the cycle.
- Next, the B Leg icon will flash in sync with an audible error indicator.
- After the B Button is pressed, the B Leg icon will stop flashing, the error indication will stop, and the controller will then go through a normal inflation cycle at B with the pump operating at a high speed throughout the cycle.
- Upon completion the unit beeps and reverts back to Test Access Mode.

Test Mode T7 - Manufacturing Test

Manufacturing Test mode is used in manufacturing with specialized test equipment to ensure proper assembly and performance. This mode is not intended for use outside of the manufacturing environment.

Test Mode – Error History

Error History test mode allows the user to access the recent error history of a device. It stores the ten most recent errors in reverse chronological order. This feature makes diagnosing device problems easy. To view the Error History, enter test access mode and select the Error History icon after T7. The Error History is shown starting with the most recent error numbered 1. The error indicator icon associated with the error will be displayed. Each time the Right Arrow Button is pressed the display will show the next error in the reverse chronological order up to 10 errors. Pressing the button again after the 10th error will return the user to the first error. If the A or B Button is pressed the controller will return to Test Access Mode.

Section VII - General Disassembly / Reassembly

Warning: Always make sure the power cord is unplugged before attempting to perform any installation or removal procedures.

- Follow ESD (Electrostatic Discharge) safety procedures to protect the electronics located within the controller.
- Remove the power cord cover by first removing the retaining screws on the cord cover door and then pulling the cover off.
- Remove the power cord by rocking back and forth until the cord is loose.
- Remove the five (5) screws that hold the front cover to the rear cover with a Torx T15 driver with an extra long handle. If this is not available, then the adjustable bed hook must be removed first. See the section regarding the adjustable bed hook.
- The front cover may now be carefully pulled away. To separate the front and rear covers, reach in and remove the transducer tube from the transducer on the front cover. The front cover can be opened to the left like a book hinging on the wire harness.
- Observe and note the locations of all tubing and wiring harnesses for ease in reassembly.
- If required, disconnect the electrical connectors and tubes so the two case halves can be separated completely.
- Reassembly is the reverse of disassembly.
- When assembling the enclosure use care to retain the molded in gasket to ensure liquid ingress protection.

Battery Pack (Removal / Installation - see Figure 9)

- Disconnect the battery wiring harness from the main CPU board, cut wire ties as required, noting their locations for reassembly.
- Slide the battery pack out of its pocket.
- Installation is the reverse of removal.

Compressor (Removal / Installation - see Figure 11)

- The compressor is not a user serviceable component. Do not disassemble. Do not oil. The compressor is held in place by friction of its molded foam enclosure.
- Disconnect the compressor wiring harness from the controller Board on the front case and cut wire ties as required, noting their locations for reassembly.

- Disconnect the compressor output tube at the check valve.
- Remove the compressor intake tubing from the muffler.
- Slide the compressor out of its pocket with its molded foam enclosure.
- If a new compressor is installed, perform a burn-in test (test mode 1). This test takes approximately 16 hours, but can run unattended.
- Installation is the reverse of removal.

Muffler (Removal / Installation)

- The muffler is a custom plastic part used to keep the Kendall SCD 700 series compression system running quietly.
- To remove the muffler, detach the compressor intake tubing and pull the compressor outlet check valve from its retaining clip.
- Remove the two screws holding it in place and remove the muffler.
- For reinsertion of the muffler be sure to route the intake tubing properly.

Valve Manifold (Removal / Installation)

- Remove the muffler (see previous section).
- The valve manifold is located in the center of the controller on the rear case. It is a plastic manifold block with six solenoid valves. No attempt should be made to repair a damaged manifold or valve. Return the entire assembly for repair or replacement.
- Inspect tubes that lead to the manifold for kinks and proper attachment before performing any work. Detach all tubing from the manifold fittings. Note the location of connections and the tubing routing for ease of reassembly.
- Disconnect the valve wiring harness from the controller Board on the front case. Cut wire ties as required, noting their locations for reassembly (see Figures 11 and 12).
- Remove the muffler by detaching the compressor intake tubing and pullingthe compressor outlet check valve from its retaining clip.
- Remove the three screws holding it in place and remove the muffler.
- Remove the three screws from the valve manifold assembly and pull it from the enclosure.
- Installation is the reverse of removal.

Power Supply Board (Removal / Installation)

CAUTION: Use a grounded strap when handling any electronic components.

- The power supply has no user serviceable parts except for the fuses. No attempt should be made to repair a damaged supply. Return to the factory for repair or replacement.
- Disconnect the 4-pin controller board wiring harness and the 2-pin fan wiring harness from the power board.
- Remove the tubing in front of the power supply.
- Disconnect equipotential lug wire.
- The power supply board is held in place by channels on the side of the rear case as well as retaining brackets on the front case.
- To remove the power board, slide the board out from the rear case.
- Installation is the reverse of removal.

Fan, Fan Filter and Exhaust Filter (Removal / Installation - see Figure 9)

- The fan filter is located in a pocket within the power cord attachment area. With the power cord door and power cord removed, reach in from the rear of the controller to remove the filter for cleaning or replacement.
- The exhaust filter is located in a pocket under the bed hook pivot cover. With the pivot cover removed, the exhaust filter can be removed for cleaning or replacement.
- To remove the fan, disconnect the 2-pin fan connector from the power board. Cut wire ties as required, noting their locations for reassembly.
- Remove the three screws from the fan and remove it from the enclosure.
- Installation is the reverse of removal. Use care to ensure that the direction of flow is correct. The fan is intended to pull air through the power cord door. Note the molded arrow in the fan case showing the flow direction.
- For optimum cooling and quietness, use only Covidien replacement fans.

Main CPU Board and Graphical Display (Removal/Installation - see Figure 9)

CAUTION: Use a grounded strap when handling any electronic components.

- The power supply has no user serviceable parts except for the fuses. No attempt should be made to repair a damaged supply. Return to the factory for repair or replacement.
- Disconnect the 4-pin controller board wiring harness from the power board.
- Remove the tubing in front of the power supply.
- Disconnect equipotential lug wire.
- The power supply board is held in place by channels on the side of the rear case as well as retaining brackets on the front case.
- To remove the power board slide, the board out from the rear case.
- Installation is the reverse of removal.

Adjustable Bed Hook (Removal/Installation)

- The Adjustable Bed Hook can be removed without disassembly of the entire controller.
- Facing the rear of the controller, locate and remove the screws that hold on the pivot cover and remove the pivot cover.
- Place the controller on its front on a non-marring surface.
- Grasp both the left and right sides of the bed hook at the pivot point. Pull the bed hook out while simultaneously rotating the bed hook up toward the top of the controller.
- Torsion springs may snap free or slide off the mandrel of the pivot. Use care so the torsion springs do not release hazardously. Note their location for ease of reassembly.
- When reinstalling reverse these steps, being careful to start reinsertion with the bed hook rotated upward toward the top of the controller.

Section VIII - Parts Listing

To order repair parts listed here, call Covidien at (800) 962-9888 - USA; 877-664-8926 - Canada; (+44) 1869328065 - International. Contact Customer Service for availability of parts not listed below.

Description	Order Part Number
Front Enclosure Assembly	1033365
Bed hook Assembly	1033366
Rear Enclosure Assembly	1036258
Power supply circuit board	1050807
Membrane switch panel	1029095
Power cord	F090740
Power cord (UK)	F090705
Power cord (Europe)	F090704
Power cord (Japan)	F090740
Power cord (Australia/New Zealand)	F090706
Power cord (China)	1046852
Power cord (Brazil)	1030183
Power cord (India)	1046854
Power cord door	1029080
Fan assembly	1029072
Fan filter	1036057
Battery Pack	1050090/1030950
Valve manifold assembly	1029057
Compressor assembly	1029075
Tube Set (sold in pairs)	9528
Fuse	1051095
Exhaust Filter	1036056
LCD Display*	1029099
Main CPU Printed Circuit Assembly	1056673
LCD Display*	1058683
Main CPU Printed Circuit Assembly	1062408

*When ordering an LCD Display, ensure compatibility with the main CPU printed circuit board.

Section IX - Specifications

Kendall SCD 700 Series Compression System

Safety Standards	Built to UL60601-1, CSA-C22.2 No. 601.1-M90, CSA C22.2 N0. 60601-1: 2008, JIS T 0601-2-204, EN60601-1, ANSI/AAMI ES60601-1:2005 and IEC 60601-1-2:2007 Standards UL Classified File # E189131 and E351453
Device Classification	Class I - Equipment Internally Powered, Portable Type BF Applied Parts Not AP or APG Equipments
Mode of Operation	Continuous
Ingress Protection	IP23 (IEC 529)
Compression Type	Leg Sleeves: Sequential, Gradient, Circumferential; Foot Cuffs: Uniform
Compression Cycle	Leg Sleeves: 11 Seconds Compression; Foot Cuffs: 5 Seconds Compression Decompression time based upon Vascular Refill Detection measurement
Set Pressure	Leg Sleeves: 45 mmHg Foot Cuffs: 130 mmHg
Adjustable Bed Hook	Yes
Power Cord Storage	Yes
Audible/Visual Errors	Low Pressure, High Pressure, Internal Electronics Malfunction
Power Cord	13 feet long with region specific appropriate cordage and plug
Controller Dimensions	Height: 6.8 inches (17.3 cm) Width: 7.7 inches (19.6 cm) Depth: 4.5 inches (11.4 cm) (when placed on a foot board) Depth: 7.3 inches (18.5 cm) (free standing)
Controller Weight	5.0 lbs. (2.3 kg)
Power Requirements	100-240 VAC, 50VA, 50/60 Hz
Battery	10.8 V, 2200mAh, Lithium Ion pack Run Time: 6-8 hours Charge Time: 4 hours (charging only)
Shipping Unit	Each
Shipping Case Dimensions	11.6 inches (29.4 cm) X 9.25 inches (23.5 cm) X 13.25 inches (33.7cm)
Shipping Weight	7 lbs. 4 oz. (3.3 kg)
Tubing Set	Included, set of two individual assemblies
Operation & Service Manual	Included as either CD or Paper Manual
Operating Conditions	Temperature: 10°C to 40°C Relative Humidity: 85% Maximum, non-condensing Atmospheric Pressure: 700 mbar to 1060 mbar
Transport & Storage	-20°C (-4°F) to 55°C (131°F) If the user suspects that the environment conditions for transport and storage have been exceeded, return the unit for service.

Warning: Medical electrical equipment needs special precautions regarding EMC and needs to be installed according to the EMC information provided. Careful consideration of this information is essential when stacking or collocating equipment and when routing cables and accessories.
Warning: RF mobile communications equipment can effect medical electrical equipment.

Guidance and manufacturer's declaration - electromagnetic emissions		
The Kendall SCD 700 series compression system is intended for use in the electromagnetic environment specified below. The customer or the user of the Kendall SCD 700 series should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The Kendall SCD 700 series uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Group B	The Kendall SCD 700 series is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration – electromagnetic immunity			
The Kendall SCD 700 series is intended for use in the electromagnet environment specified below. The customer or the end user of the Kendall SCD 700 series should assure that it is used in such an environment.			
Immunity test	**IEC 60601 Test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0.5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	<5 % U_T (>95 % dip in U_T) for 0.5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Kendall SCD 700 series controller requires continued operation during power mains interruptions, it is recommended that the Kendall SCD 700 series be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration - electromagnetic emissions

The Kendall SCD 700 series controller is intended for use in the electromagnetic environment specified below. The customer or the user of the Kendall SCD 700 series should assure that it is used in such an environment.

Immunity test	IEC 60601 Test level	Compliance Level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the Kendall SCD 700 series controller, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = \left[\frac{3.5}{V_1}\right]\sqrt{P}$ $d = \left[\frac{3.5}{E_1}\right]\sqrt{P}$ 80 MHz to 800 MHz $d = \left[\frac{7}{E_1}\right]\sqrt{P}$ 800 MHz to 2.5 GHz
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	where ***P*** is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and ***d*** is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol:

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Kendall SCD 700 series controller is used exceeds the applicable RF compliance level above, the Kendall SCD 700 series should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Kendall SCD 700 series controller.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distance between Portable and mobile RF communications equipment and the Kendall SCD 700 series @ 3Vrms

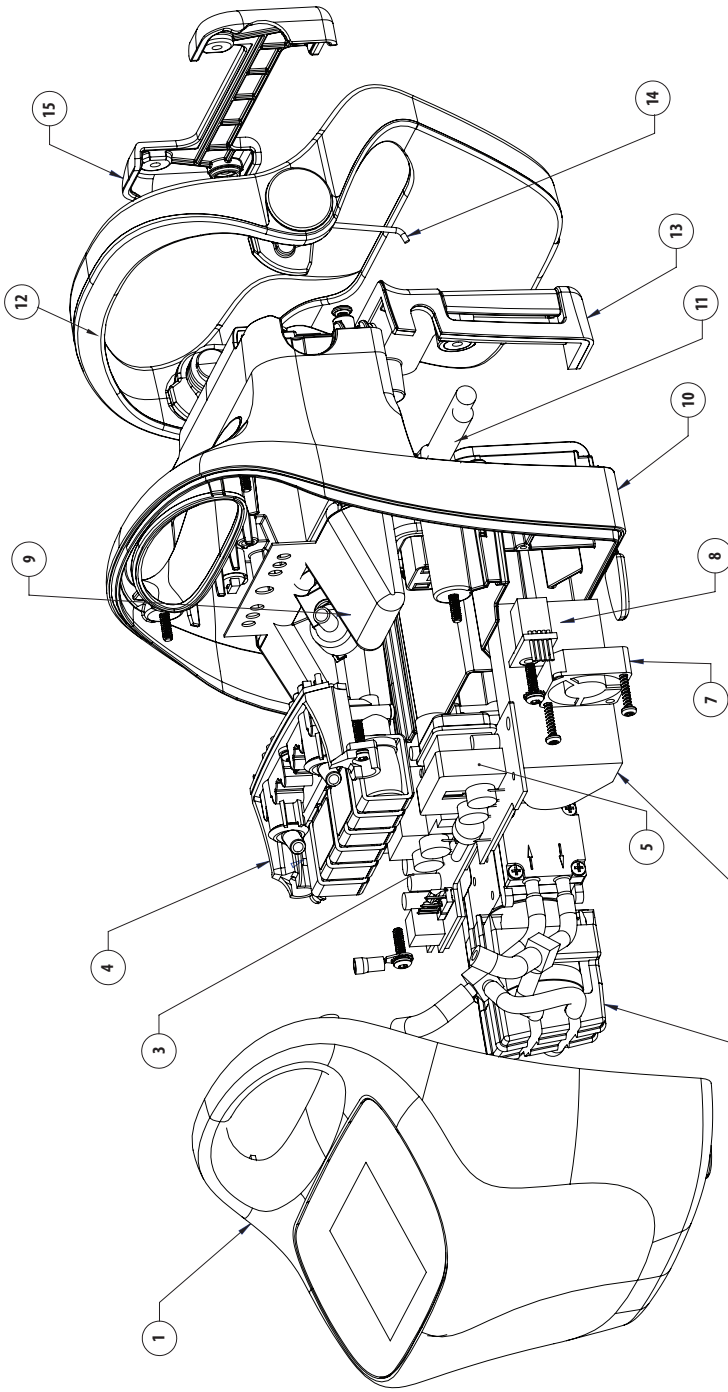
The Kendall SCD 700 series controller is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Kendall SCD 700 series can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Kendall SCD 700 series controller as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = \left[\frac{3.5}{V_1}\right]\sqrt{P}$	80 MHz to 800 MHz $d = \left[\frac{3.5}{E_1}\right]\sqrt{P}$	800 MHz to 2.5 GHz $d = \left[\frac{7}{E_1}\right]\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.69	3.69	7.38
100	11.67	11.67	23.33

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.
Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Figure 9 - Parts Assembly Diagram – Exploded view (Page 1 of 2)



Controller Parts List

1. Front Enclosure assembly
2. Compressor assembly
3. Power supply circuit board
4. Valve manifold assembly
5. Fuse (pair)
6. Battery pack
7. Fan assembly
8. USB connector
9. Muffler
10. Rear Enclosure assembly
11. Power cord (see spare parts insert for country specific cord)
12. Bed hook
13. Power cord door
14. Bed hook spring (2X)
15. Bed hook Pivot cover
16. Membrane switch panel (pg. 2)
17. LCD Display (pg. 2)
18. Protective Shield (pg. 2)
19. Main CPU Board (pg. 2)
20. Screws 6-32 x 1-1/2 (pg. 2)

Figure 9 - Parts Assembly Diagram (front enclosure)– Exploded view (Page 2 of 2)

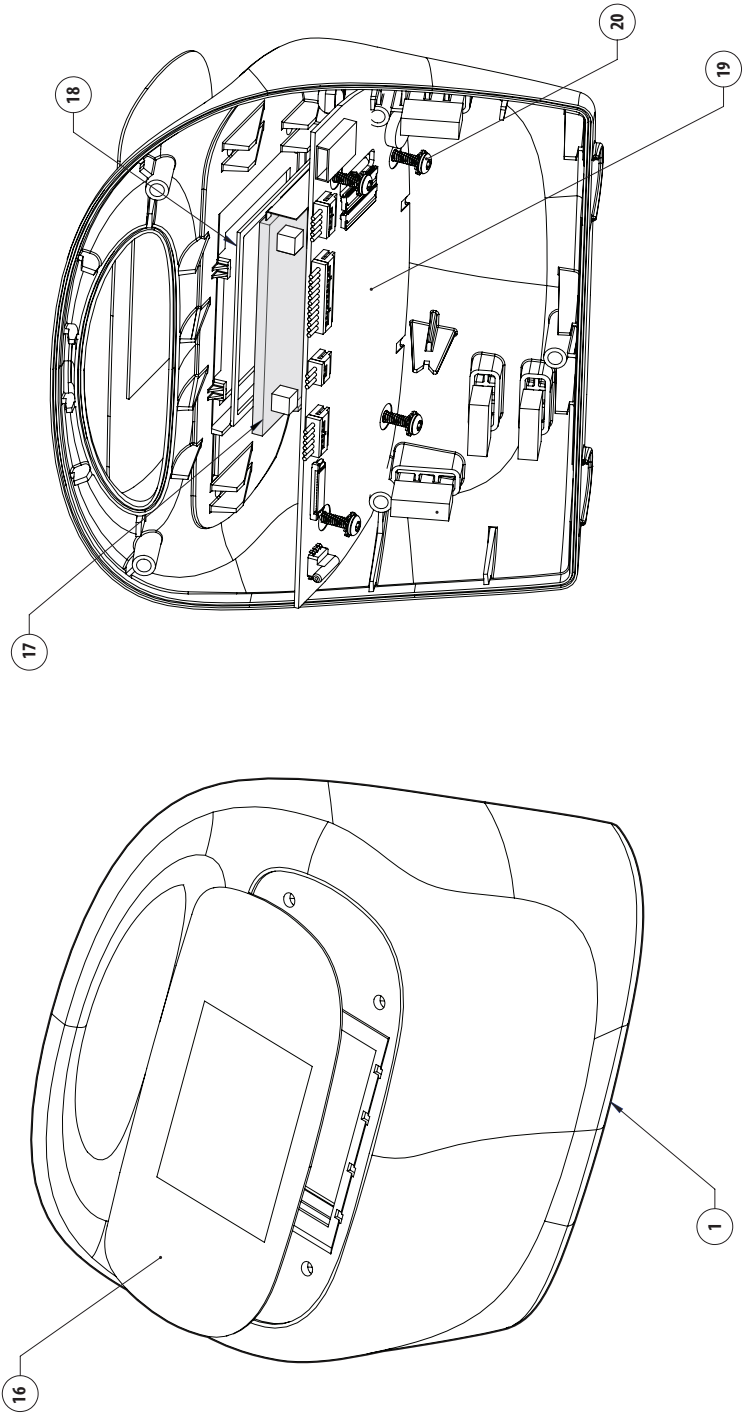


Figure 10 - Pneumatic & Electrical Schematic

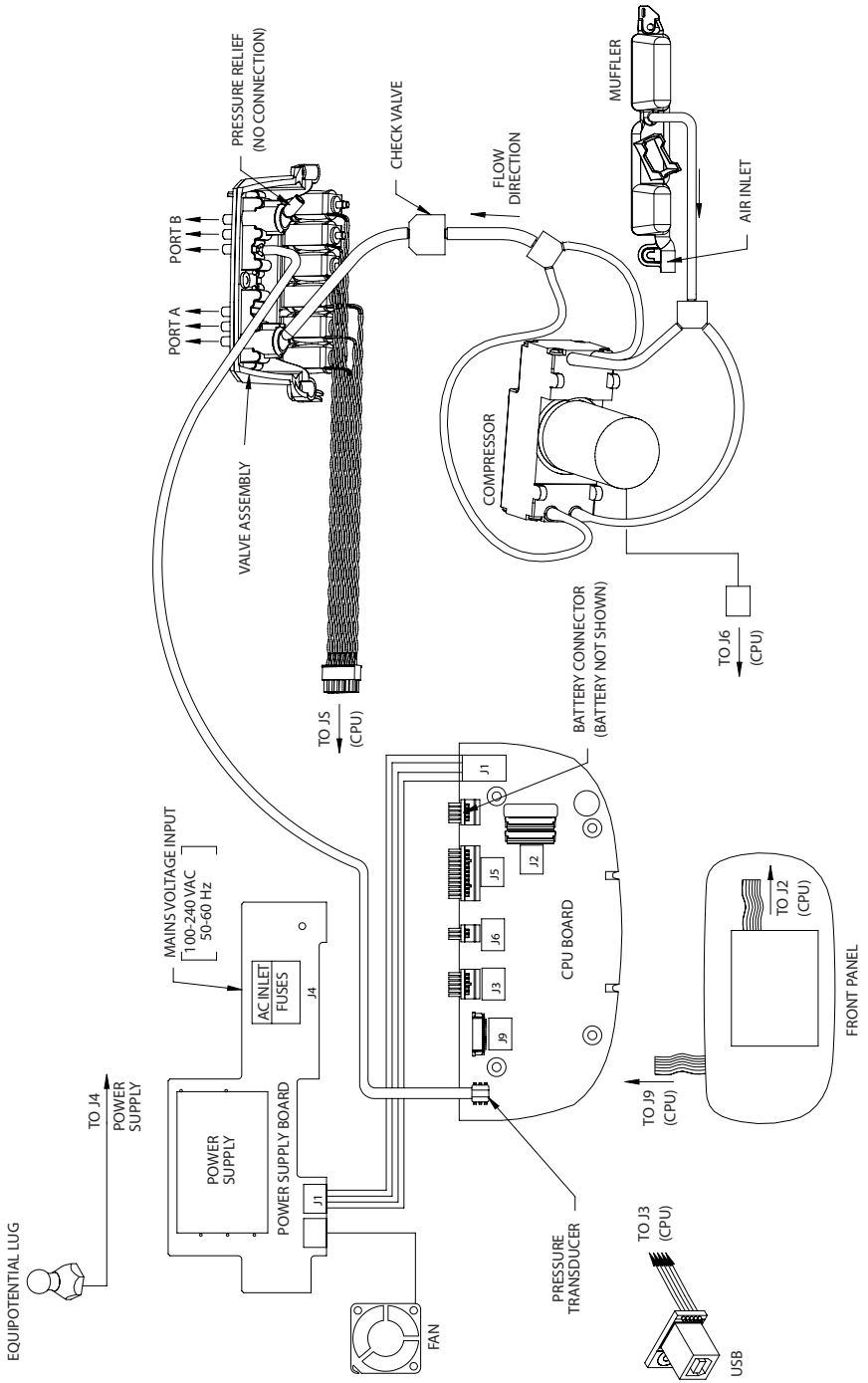


Figure 11 - Rear Enclosure View

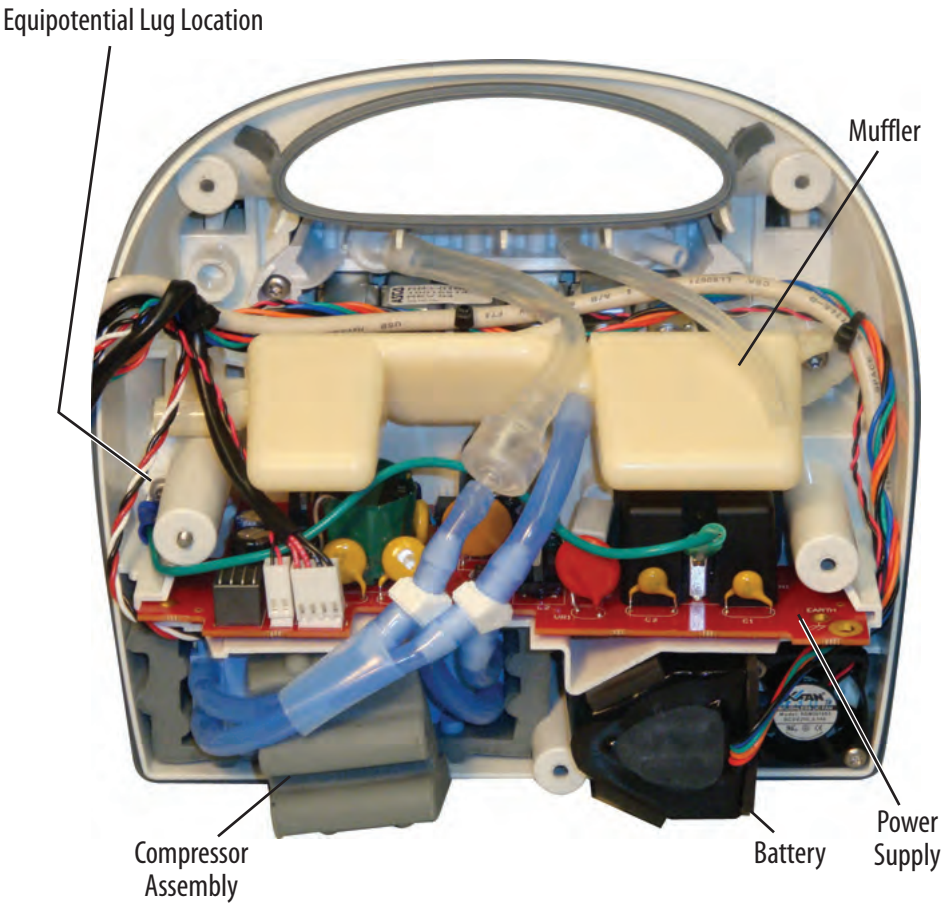
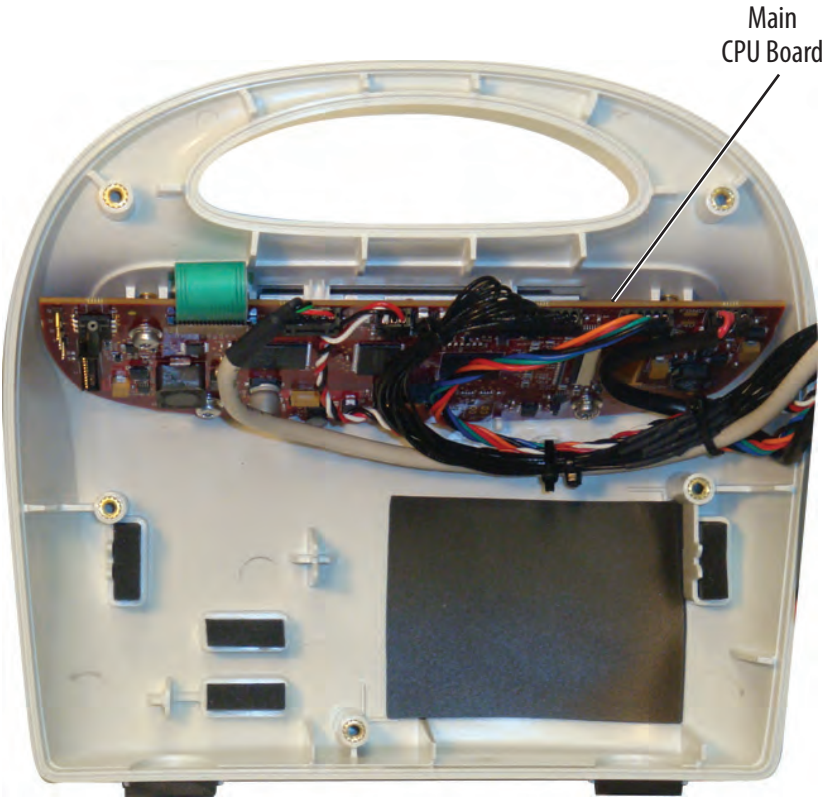


Figure 12 - Front Enclosure View



Caution, consult accompanying documents

Identification of a substance that is not contained or present within the product or packaging. • Identification d'une substance non présente dans le produit ou l'emballage. • Identifizierung einer Substanz, die weder im Produkt noch in der Verpackung enthalten bzw. vorhanden ist. • Identificazione di una sostanza che non è contenuta né presente nel prodotto o nella confezione. • Identificación de una sustancia no contenida o que no esté presente dentro del producto o embalaje. • Identifiering av ett ämne som inte ingår eller förekommer i produkten eller förpackningen. • Identificatie van een stof die niet in het product of de verpakking is vervat of aanwezig is. • Identificação de uma substância não contida ou não existente no produto ou embalagem. • Tuotteessa tai pakkauksessa olemattoman aineen tunnistus. • Identifikation af et stof, der ikke er indeholdt eller til stede i produktet eller emballagen. • Αναγνώριση ουσίας που δεν περιέχεται ή δεν υπάρχει στο προϊόν ή στη συσκευασία. • Identifikace látky, která není obsažena nebo přítomna v produktu nebo obalu. • Olyan anyag azonosítása, amelyet sem a terméknek, sem a csomagolás nem tartalmaz, vagy amely azokban nincs jelen. • Определение вещества, не содержащегося или не присутствующего в продукте и упаковке. • Identyfikacja substancji nie zawartej i nieobecnej w produkcie lub jego opakowaniu. • Ürün veya ambalajında bulunmayan veya var olmayan bir madde tanımlaması. • Identifikasjon av et stoff som ikke er til stede i produktet eller emballasjen. • Označenie látky, ktorá nie je obsiahnutá alebo prítomná v produkte ani obale. • Identificarea unei substanțe care nu este conținută sau prezentă în cadrul produsului sau al ambalajului. Данни за вещество, което не се съдържа или не се намира в продукта или опаковката.

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